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Redescription of *Ischadites elrodi* (S. A. Miller, 1892) a Lower Devonian Receptaculitid

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ABSTRACT

Ischadites elrodi (S. A. Miller, 1892) a Lower Middle Devonian receptaculitid from Indiana is redescribed as a dasycladacean alga closely related to Silurian *Ischadites koenigii* Murchison, 1839.

INTRODUCTION

S. A. Miller (1892a) described and illustrated a new species of *Receptaculites elrodi* from the Lower Middle Devonian of Indiana. He assigned it to the family Receptaculitidae, class Porifera, subkingdom Protozoa. He considered that it may belong to *Ischadites*, but because of the concave shape of the top of the fossil he preferred to assign it to *Receptaculites*. Miller based his description upon one specimen only (fig. 1). This fossil is now housed with the University of Chicago collection (Walker Museum) in Field Museum of Natural History.

The species has not been systematically studied since Miller's (1892a) first description. Miller (1894) republished his original description and figures, and the fossil has been listed in catalogues (Miller, 1892a; Head, 1895; Nitecki, 1965). Nitecki (1969) tentatively suggested that *I. elrodi* belongs with *I. koenigii* Murchison, 1839. However, the detailed study of the holotype indicates that *elrodi*, although closely related to *koenigii*, constitutes a distinct species. Therefore, *Ischadites elrodi* (Miller, 1892) is now redescribed as dasycladaceous alga.

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Systematic Description

Class Chlorophyceae Kützing, 1845

Order Dasycladales Pascher, 1931

Family Receptaculitaceae Eichwald, 1860

Tribe Receptaculiteae Nitecki, 1969

Genus *Ischadites* Murchison, 1839

Ischadites elrodi (S. A. Miller, 1892). Figures 1–3.

Receptaculites elrodi S. A. Miller, 1892, Palaeontology. In advance 18th Rept. Geol. Surv. Ind., pp. 3–4, pl. 1, figs. 1–3; S. A. Miller, 1892, First appendix, p. 668; S. A. Miller, 1894, 18th Rept. Geol. Surv. Ind., pp. 257–258, pl. 1, figs. 1–3; Head, 1895, Cat. Paleo. sponges, p. 4; Nitecki, 1965, Fieldiana: Geol., **13**, p. 503.

Ischadites koenigii (in part) Nitecki, 1969, Geol. Soc. Amer. Abstr., part 6, pp. 33–34.

Definition.—Thallus pyriform; stalk probably elongated; main axis basally thin, apically possibly inflated; thin, weakly calcified laterals distributed throughout main axis; lateral heads present; calcified stellate structures of three, four or possibly more ribs; growth in helix; Lower Middle Devonian.

Description.—Thallus: The shape of the thallus is well preserved. The lower broken end is suggestive of an elongation of the body in the form of a stem (fig. 2). The area at the very top of the thallus is slightly collapsed and somewhat damaged in a manner common to many other receptaculitids. There is a slight flexure to the otherwise erect plant, and the thallus appears somewhat bent.

Main axis: The main axis is not calcified and hence is not preserved. Its anatomy is deduced from the length and distribution of laterals. In the lower part of the thallus the proximal ends of laterals are almost in contact with each other (fig. 3). This indicates that the main axis is very thin in the older lower parts of thallus. Upper part of the plant is expanded and the body shape suggests that the main axis is apically inflated.

Laterals: The laterals are thin but distally are expanding rapidly and form heads. There are about 32 laterals at the base of the thallus (fig. 3). The number of laterals at the equatorial region of the plant appears much larger but their exact number cannot be determined. There are about 20 spiral lines and approximately 40 apparent whorls (fig. 1).

FIG. 1. *Ischadites elrodi* (S. A. Miller, 1892). Holotype UC 6052; Geneva Dolomite; near Hartsville, Indiana.

Laterals are arranged in a helix and new laterals are added apically. The laterals are seemingly packed in whorls. This is common to many ischaditids and is caused by the compression of the helix. Laterals are distributed throughout the main axis.

STELLATE STRUCTURES: Stellate structures are preserved on many laterals. They appear to consist of three, four, or perhaps even more ribs; however, four ribs seem the commonest arrangement. The stellate structures are often misplaced and are thus found at different levels of laterals below or even above the lateral heads. This misplacement is possible because these structures are relatively

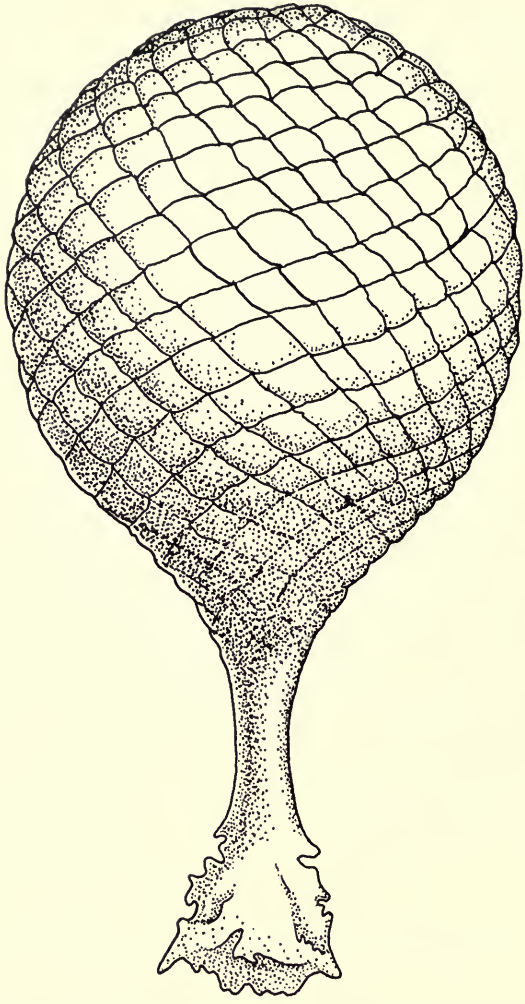

FIG. 2. Reconstruction of *I. elrodi*. The stalk may have been shorter.

strong and not easily damaged. Stellate structures are not observed in the lower part of the thallus.

CALCIFICATION: Calcification is weak along the proximal parts of the lateral branches and heavy on the distal parts. Lateral heads are thin and their impressions are very conspicuous; therefore, the exterior of the heads was heavily calcified. The stellate structures are very common and well calcified.

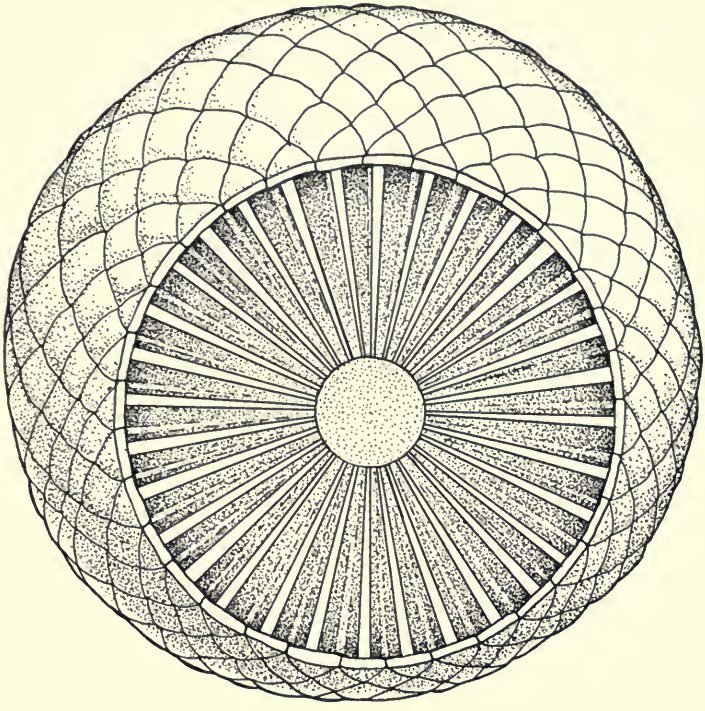

FIG. 3. Diagrammatic representation across the lower broken-off part of thallus of *I. elrodi*. The number of laterals (32) is reconstructed; second row of laterals is suggested; stellate structures are omitted.

Discussion.—RELATIONSHIP: This fossil is similar to specimens of *I. koenigii* Murchison in the following ways: the shape of thallus, the distribution and general shape of laterals, the growth pattern, and the presence of three or four ribs of stellate structures. The species differs from *koenigii* in the possible presence of more than four ribs of stellate structures, in its stratigraphic distribution, larger facets, and apparently smaller number of branches. The laterals are distributed on all parts of the main axis, and not only around the apical part of the central vesicle, as is the case in *I. koenigii*.

Nitecki (1969) assigned *I. elrodi* to *I. koenigii*; however, until more specimens are located the species *elrodi* is retained here.

ECOLOGY: The alga is preserved in an erect growth position, however, there appears a slight curvature to the thallus, an indication of a gentle water movement or current. The plant has not been moved about the bottom.

PRESERVATION: The exterior of the thallus consists of crystalline quartz with well-developed pyramidal and prism faces. The interior of the fossil is of quartzite-like silica with imbedded fine-grained quartz. The black material within the grooves is graphite or india ink that washes away with a brush. It appears to have been used in preparation for Miller's original figures.

The fossil is a cast and the small holes on the surfaces represent cross-sections of laterals. One part of the surface of the thallus is cut, and another portion is somewhat abraded. The area on top of the fossil appears to have "many apertures" (Miller, 1892a). These apertures may possibly be morphological structures; however, they are highly suggestive of poor preservation aided by mechanical abrasion.

Stratigraphic position and locality.—Miller (1892a and subsequent) lists the locality as Upper Helderberg Group, near Hartsville, Indiana. He suggests that the fossil came from a limestone matrix and indicates that the locality is known to him. The museum catalogs and labels do not provide any additional information. The Hartsville area was visited in the fall of 1968, but no additional specimens were found, nor was the exact stratigraphic location determined. The fossil is assigned (with reservations) to the Geneva Dolomite of the Lower Middle Devonian.

Growth.—The growth is in a distinct helix. However, the direction of the helix cannot be determined.

Material.—Holotype UC 6052, Gurley Collection, University of Chicago, now housed in Field Museum of Natural History.

Measurements.—Height of thallus 5.37 cm., maximum diameter of thallus 4.61 cm.

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Dr. Carl B. Rexrod, Indiana Geological Survey, commented on the stratigraphic position of *Ischadites elrodi* (S. A. Miller) and Dr. Alan Horowitz, Department of Geology, Indiana University, guided the author in the field. Mr. Richard Roesener prepared the drawings.

REFERENCES

HEAD, WILLIAM R.
1895. Palaeozoic sponges of North America. Published by the author, Chicago, Illinois. 11 pp.

MILLER, S. A.

1892a. Palaeontology. Advance sheets from the 18th Rept. Geol. Survey Indiana. 79 pp., 12 pls.

1892b. First Appendix, 1892 [to North American Geology and Palaeontology]. Pp. 665–718, text-figs. 1,195–1,265.

1894. Palaeontology. Indiana Dept. Geol. Natural Resources, 18th Ann. Rept., pp. 257–356, 12 pls.

NITECKI, MATTHEW H.

1965. Catalogue of type specimens in Chicago Natural History Museum. Porifera. Fieldiana: Geol., **13**, no. 6, pp. 477–509.

1969. Nature and variations of *Ischadites koenigii* Murchison. Geol. Soc. Amer. Abstr. Programs for 1969, part 6, pp. 33–34.

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